

Serial No. 09/234,518
Amendment dated July 6, 2005
Reply to Office Action of February 7, 2005

Docket No. K-0078

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claims 1-14. (Canceled)

15. (Currently Amended) A method of processing signals using medium access control sub-layers in a communications system which has a plurality of mobile terminals and a base station, said medium access control sub-layers being respectively provided in said mobile terminals and base station, said method comprising:

performing, in each of said medium access control sub-layers, self-basic functions or functions associated with upper layers or a lower layer of said mobile terminals and/or said base station, said performing step being performed if signal processing operations of a corresponding one of said mobile terminals, of said base station, or between said corresponding mobile terminal and said base station are requested;

performing a synchronization information of system information broadcasting control operation between said corresponding mobile terminal and said base station, said step of performing said broadcasting control operating including:

sending time information, system information and paging information

from said base station to said corresponding mobile terminal if said broadcasting control operation between said corresponding mobile terminal and said base station is requested; and receiving said time information, system information and paging information from said base station and transferring a synchronization request message or system information update requested message to said lower layer of said corresponding mobile terminal~~The signal processing method as set forth in claim 14, further comprising:~~

performing a random access control operation between said corresponding mobile terminal and said base station, said step of performing said random access control operation including:

sending a radio resource request message from said corresponding mobile terminal to said base station if said random access control operation between said corresponding mobile terminal and said base station is requested;

sending a radio resource request acknowledge message from said base station to said corresponding mobile terminal;

sending a radio resource response message from said base station to said corresponding mobile terminal; and

transferring a radio resource response reception message to a specific one of said upper layers of said corresponding mobile terminal.

16. (Currently Amended) A method of processing signals using medium access control sub-layers in a communications system which has a plurality of mobile terminals and a base station, said medium access control sub-layers being respectively provided in said mobile terminals and base station, said method comprising:

performing, in each of said medium access control sub-layers, self-basic functions or functions associated with upper layers or a lower layer of said mobile terminals and/or said base station, said performing step being performed if signal processing operations of a corresponding one of said mobile terminals, of said base station, or between said corresponding mobile terminal and said base station are requested;

performing a synchronization information of system information broadcasting control operation between said corresponding mobile terminal and said base station, said step of performing said broadcasting control operating including:

sending time information, system information and paging information from said base station to said corresponding mobile terminal if said broadcasting control operation between said corresponding mobile terminal and said base station is requested; and

receiving said time information, system information and paging information from said base station and transferring a synchronization request message or system information update requested message to said lower layer of said corresponding mobile terminal~~The signal processing method as set forth in claim 14, further comprising:~~

performing a lower channel activation or deactivation control operation of said corresponding mobile terminal or base station, said step of performing said lower channel activation or deactivation control operation including:

transferring a communication path activation or deactivation request message from a specific one of said upper layers of said corresponding mobile terminal or base station to said lower layer of said corresponding mobile terminal or base station if said lower channel activation or deactivation control operation of said corresponding mobile terminal or base station is requested;

allowing said lower layer to activate or deactivate a communication path in response to said communication path activation or deactivation request message from said specific upper layer; and

allowing said lower layer to transfer the activated or deactivated result to said specific upper layer.

17. (Previously Presented) A method of processing signals using medium access control sub-layers in a communications system which has a plurality of mobile terminals and a base station, said medium access control sub-layers being respectively provided in said mobile terminals and base station, said method comprising:

performing, in each of said medium access control sub-layers, self-basic functions

or functions associated with upper layers or a lower layer of said mobile terminals and/or said base station, said performing step being performed if signal processing operations of a corresponding one of said mobile terminals, of said base station, or between said corresponding mobile terminal and said base station are requested; and

performing a cell condition or channel condition reporting operation of said corresponding mobile terminal, said step of performing said cell condition or channel condition reporting operation including:

sending a cell condition or channel condition measurement request message from said base station to said corresponding mobile terminal if said cell condition or channel condition reporting operation of said corresponding mobile terminal is requested;

transferring a cell condition or channel condition measurement command to said lower layer of said corresponding mobile terminal in response to said cell condition or channel condition measurement request message from said base station;

allowing said lower layer of said corresponding mobile terminal to measure a cell condition of said corresponding mobile terminal in response to said cell condition or channel condition measurement command; and

sending a measured result of said cell condition or channel condition from said lower layer of said corresponding mobile terminal to said base station.

18. (Previously Presented) The signal processing method as set forth in claim ~~14~~15 or 16, further comprising:

performing a control information/user information request operation of said corresponding mobile terminal or base station, said step of performing said control information/user information request operating including:

sending a control information/user information request message from a specific one of said upper layers of said corresponding mobile terminal or base station to said base station or corresponding mobile terminal if control information and user information are requested by said specific upper layer of said corresponding mobile terminal or base station.

19. (Canceled)

20. (Previously Presented) A method of processing signals using medium access control sub-layers in a communications system which has a plurality of mobile terminals and a base station, said medium access control sub-layers being respectively provided in said mobile terminals and base station, said method comprising:

performing, in each of said medium access control sub-layers, self-basic functions or functions associated with upper layers or a lower layer of said mobile terminals and/or said base station, said performing step being performed if signal processing operations of a

corresponding one of said mobile terminals, of said base station, or between said corresponding mobile terminal and said base station are requested; and

performing a handover control operation of said corresponding mobile terminal or base station, said step of performing said handover control operation including:

transferring a handover command from a specific one of said upper layers of said corresponding mobile terminal or base station to said lower layer of said corresponding mobile terminal or base station if a handover operation of said corresponding mobile terminal or base station is requested;

allowing said lower layer to perform said handover operation in response to said handover command from said specific upper layer; and

transferring a result of said handover operation from said lower layer to said specific upper layer.

21. (Previously Presented) A method of processing signals using medium access control sub-layers in a communications system which has a plurality of mobile terminals and a base station, said medium access control sub-layers being respectively provided in said mobile terminals and base station, said method comprising:

performing, in each of said medium access control sub-layers, self-basic functions or functions associated with upper layers or a lower layer of said mobile terminals and/or said

base station, said performing step being performed if signal processing operations of a corresponding one of said mobile terminals, of said base station, or between said corresponding mobile terminal and said base station are requested; and

performing a communication path modification control operation between said corresponding mobile terminal and said base station, said step of performing said communication path modification control operation including:

transferring a communication path modification request message from a specific one of said upper layers of said corresponding mobile terminal or base station to said lower layer of said corresponding mobile terminal or base station if said communication path modification control operation between said corresponding mobile terminal and said base station is requested;

allowing said lower layer to modify a communication path in response to said communication path modification request message from said specific upper layer; and

transferring a modified result from said lower layer to said specific upper layer.

22. (Canceled)

23. (Currently Amended) The signal processing method as set forth in claim ~~14~~15 or 16, wherein each of said medium access control sub-layers is adapted to determine formats of data frames according to types of messages to be sent, and

wherein each of said medium access control sub-layers includes:

a forward access channel associated with a channel request acknowledge message and channel response message which are sent from said base station to said corresponding mobile terminal; and

a reverse access channel associated with a channel request message which is sent from said corresponding mobile terminal to said base station.

24. (Previously Presented) A method of processing signals using medium access control sub-layers in a communications system which has a plurality of mobile terminals and a base station, said medium access control sub-layers being respectively provided in said mobile terminals and base station, said method comprising:

performing, in each of said medium access control sub-layers, self-basic functions or functions associated with upper layers or a lower layer of said mobile terminals and/or said base station, said performing step being performed if signal processing operations of a corresponding one of said mobile terminals, of said base station, or between said corresponding mobile terminal and said base station are requested,

wherein each of said medium access control sub-layers is adapted to determine formats of data frames according to types of messages to be sent,

wherein each of said medium access control sub-layers includes:

a forward access channel associated with a channel request acknowledge message and channel response message which are sent from said base station to said corresponding mobile terminal; and

a reverse access channel associated with a channel request message which is sent from said corresponding mobile terminal to said base station, and

wherein said channel request acknowledge message has a data frame including an address field region, a reserved region, a medium access control frame type region and a cyclic redundancy check region for detection of a frame error.

25. (Previously Presented) A method of processing signals using medium access control sub-layers in a communications system which has a plurality of mobile terminals and a base station, said medium access control sub-layers being respectively provided in said mobile terminals and base station, said method comprising:

performing, in each of said medium access control sub-layers, self-basic functions or functions associated with upper layers or a lower layer of said mobile terminals and/or said base station, said performing step being performed if signal processing operations of a corresponding one of said mobile terminals, of said base station, or between said corresponding mobile terminal and said base station are requested,

wherein each of said medium access control sub-layers is adapted to determine

formats of data frames according to types of messages to be sent,

wherein each of said medium access control sub-layers includes:

a forward access channel associated with a channel request acknowledge message and channel response message which are sent from said base station to said corresponding mobile terminal; and

a reverse access channel associated with a channel request message which is sent from said corresponding mobile terminal to said base station, and

wherein said channel response message has a data frame including an address field region, a reserved region, a medium access control frame type region, a cyclic redundancy check region for detection of a frame error, an information region, a padding region and an end of field region.

26. (Previously Presented) A method of processing signals using medium access control sub-layers in a communications system which has a plurality of mobile terminals and a base station, said medium access control sub-layers being respectively provided in said mobile terminals and base station, said method comprising:

performing, in each of said medium access control sub-layers, self-basic functions or functions associated with upper layers or a lower layer of said mobile terminals and/or said base station, said performing step being performed if signal processing operations of a

corresponding one of said mobile terminals, of said base station, or between said corresponding mobile terminal and said base station are requested,

wherein each of said medium access control sub-layers is adapted to determine formats of data frames according to types of messages to be sent,

wherein each of said medium access control sub-layers includes:

a forward access channel associated with a channel request acknowledge message and channel response message which are sent from said base station to said corresponding mobile terminal; and

a reverse access channel associated with a channel request message which is sent from said corresponding mobile terminal to said base station, and

wherein said channel request message has a data frame including an address field region, a reserved region, a medium access control frame type region, a cyclic redundancy check region for detection of a frame error, a paging slot number region and a paging channel number region.

27. (Previously Presented) A method of processing signals using medium access control sub-layers in a communications system which has a plurality of mobile terminals and a base station, said medium access control sub-layers being respectively provided in said mobile terminals and base station, said method comprising:

performing, in each of said medium access control sub-layers, self-basic functions or functions associated with upper layers or a lower layer of said mobile terminals and/or said base station, said performing step being performed if signal processing operations of a corresponding one of said mobile terminals, of said base station, or between said corresponding mobile terminal and said base station are requested,

wherein each of said medium access control sub-layers is adapted to determine formats of data frames according to types of messages to be sent,

wherein each of said medium access control sub-layers includes:

a forward access channel associated with a channel request acknowledge message and channel response message which are sent from said base station to said corresponding mobile terminal; and

a reverse access channel associated with a channel request message which is sent from said corresponding mobile terminal to said base station, and

wherein each of said channel request acknowledge message, channel response message and channel request message has a data frame including an address field region, a reserved region and a medium access control frame type region.

Claims 28-49. (Canceled)

50. (Currently Amended) A method for obtaining a condition of a channel or a cell by an upper layer from a medium access control sub-layer of a communication device, comprising:

 sending a measurement request from the upper layer to the medium access control sub-layer;

 obtaining a measurement indicative of the condition of the channel or the cell by the medium access sub-layer; and

 providing a result of the measurement to the upper layer from the medium access control sub-layer, wherein the upper layer includes a radio resource control (RRC) which sends the measurement request and receives the result of the measurement.

51. (Previously Presented) The method of claim 50, wherein the channel is a logical channel.

52. (Previously Presented) The method of claim 50 or 51, wherein the channel is at least one of a synchronization channel, broadcast channel, a common control channel, a dedicated control channel, a paging channel, a channel for packet data service, a random access channel, a forward access channel, or a traffic channel.

53-55 (Canceled)

56. (Currently Amended) A communication system having a plurality of mobile terminals and a communication network, each of said mobile terminals and the communication network comprising:

- a physical layer for receiving and sending information;
- a medium access control sub-layer receiving services from the physical layer; and
- an upper layer to the medium access control sub-layer for receiving services from the medium access control sub-layer, wherein

said medium access control sub-layer performing a plurality of functions or providing a plurality of services and having a plurality of separate entities, each entity performing at least one corresponding different function, and

said plurality of separate entities of said medium access control sub-layer includes:

- a broadcast entity for handling a broadcast channel,
- a common entity for handling a common channel, and
- a dedicated entity for handling a dedicated channel, wherein said plurality of functions includes ciphering and channel condition.

57. (Previously Presented) The communication system of claim 56, wherein the common channel comprises at least one of a random access channel, a forward access channel, or a paging channel.

58. (Previously Presented) The communication system of claim 56 or 57, wherein any one of the channels is a logical channel.

59. (Canceled)

60. (Previously Presented) The communication system of claim 56, wherein said plurality of separate entities of said medium access control sub-layer further comprises a data entity for handling packet data transfer.

61. (Previously Presented) The method of claim 50, wherein the communication device is a mobile terminal.

62. (Canceled)

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63. (Currently Amended) The method of claim 6250, wherein the RRC is an entity of the upper layer.

64. (Previously Presented) The method of claim 50, wherein the upper layer controls modification of a communication path.